

ments may be used in addition to, or in place of the latching profiles 296 and seal bores 298. For example, the packer 292 may be provided with internal or external threads at one or both ends for interconnection of the packer in a tubular string.

As representatively depicted in FIG. 8, a setting tool 300 is latched to the upper latching profile 296 for conveying the packer 292 into a well and setting the packer therein. The setting tool 300 has axially spaced apart annular elastomeric members 302 disposed on a generally rod-shaped mandrel 304. An annular spacer 306 maintains the spaced apart relationship of the elastomeric members 302. Each of the elastomeric members 302 is thus positioned radially opposite one of the radially reduced portions 272b.

With the setting tool 300 in the configuration shown in FIG. 8, the packer 292 may be conveyed within a tubular member (not shown) in a well. However, when the setting tool 300 is actuated to set the packer 292, the radially reduced portions 272b are radially outwardly extended, so that the packer sealingly and grippingly engages the tubular member (see FIG. 10). Radially outward extension of the radially reduced portions 272b is accomplished by displacing the mandrel 304 upward as viewed in FIG. 8 relative to the portion of the setting tool latched to the latching profile 296. The elastomeric members 302 will be thereby axially compressed between a radially enlarged portion 308 formed on the mandrel 304, the spacer 306, and the portion of the setting tool latched to the upper latching profile 296. When the elastomeric members 302 are axially compressed, they become radially enlarged, applying a radially outwardly directed force to each of the radially reduced portions 272b.

The mandrel 304 may be upwardly displaced to compress the elastomeric members 302 in any of a number of ways. For example, fluid pressure could be applied to the setting tool 300 to displace a piston therein connected to the mandrel 304, a threaded member of the setting tool engaged with the mandrel could be rotated to displace the mandrel, etc.

Referring additionally now to FIG. 9, yet another method 310 of setting the packer 292 is representatively illustrated. In the method 310, a setting tool 312 is latched to the upper latching profile 296, in a manner similar that used to latch the setting tool 300 to the packer 292 in the method 290 described above. The setting tool 312 includes spaced apart seals 314, 316, which internally sealingly engage the tubular member 294 above and below the radially reduced portions 272b. A flow passage 318 extends internally from within the setting tool 312 to the annular space radially between the setting tool and the tubular member 294 and axially between the seals 314, 316.

When it is desired to set the packer 292, fluid pressure is applied to the flow passage 318. The fluid pressure exerts a radially outwardly directed force to the interior of the tubular member 294 between the seals 314, 316, thereby radially outwardly extending the radially reduced portions 272b. The fluid pressure may be applied to the flow passage 318 in any of a number of ways, for example, via a tubular string attached to the setting tool 312, combustion of a propellant within the setting tool, etc.

Referring additionally now to FIG. 10, the packer 292 is representatively illustrated set within casing 322 lining a wellbore 324. The packer 292 sealingly and grippingly engages the casing 322. Note that the casing 322 is radially outwardly deformed opposite the radially outwardly extended radially reduced portions 272b, but such deformation is not necessary according to the principles of the present invention.

FIG. 10 representatively illustrates a method 320 of unsetting the packer 292 after it has been set, so that the packer may be retrieved or otherwise displaced from or within the well. A service tool 326 is conveyed into the casing 322 and inserted into the packer 292. The service tool 326 is latched to the upper and lower latching profiles 296 in a conventional manner.

Fluid pressure is then applied to a piston 328 attached to, or formed as a portion of, an elongated mandrel 330, which is latched to the lower latching profile 296. An axially downwardly directed force is thereby applied to the mandrel 330. This force causes the lower end of the tubular member 294 to be displaced axially downward relative to the upper end thereof, axially elongating the tubular member and causing the tubular member to radially inwardly retract.

When sufficient force is applied to elongate the tubular member 294, the sealing material 274b and grip members 276b will disengage from the casing 322, permitting the packer 292 to be retrieved from the well or otherwise displaced relative to the casing. The fluid pressure may be applied to the piston 328 in any of a number of ways, such as via a tubular string attached to the tool 326, combustion of a propellant within the setting tool, etc.

Of course, many modifications, additions, substitutions, deletions, and other changes may be made to the various embodiments of the present invention described above, which changes would be obvious to a person skilled in the art, and these changes are contemplated by the principles of the present invention. Accordingly, the foregoing detailed description is to be clearly understood as being given by way of illustration and example only, the spirit and scope of the present invention being limited solely by the appended claims.

What is claimed is:

1. A method of interconnecting first and second wellbores, the method comprising the steps of:

positioning a deflection device within the first wellbore, the deflection device having a substantially longitudinally extending guide layer outwardly overlying a body of the deflection device, and the guide layer having a hardness substantially less than that of the body; and displacing a cutting tool substantially longitudinally relative to the deflection device, a guide portion of the cutting tool contacting the guide layer, thereby guiding the cutting tool to cut an opening through a tubular structure lining the first wellbore while cutting through the guide layer.

2. The method according to claim 1 wherein the positioning step further comprises engaging the deflection device with an orienting device within the first wellbore.

3. The method according to claim 2, further comprising the step of engaging a wellbore connector with the orienting device.

4. The method according to claim 3, further comprising the step of extending a portion of the wellbore connector laterally outward into the opening.

5. The method according to claim 3, further comprising the step of drilling the second wellbore through the wellbore connector.

6. The method according to claim 5, further comprising the step of sealingly engaging the wellbore connector with a tubular member extending into the second wellbore.

7. Apparatus for forming an opening through a tubular structure lining a wellbore, the apparatus comprising:

an elongated body having a generally longitudinally extending outer side surface portion positionable to

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face the intended opening location on the tubular structure, and along which a cutting tool may be moved while forming the opening; and

a guide layer attached to the outer side surface portion, the guide layer having a hardness substantially less than that of the body and being removable by a cutting tool as it moves along the outer side surface portion while forming the opening.

8. The apparatus according to claim 7, wherein the body further has an orienting device engagement portion attached thereto, the engagement portion being configured for engagement with an orienting profile positioned in the wellbore.

9. The apparatus according to claim 7, wherein the body further has a laterally inclined deflection surface formed thereon proximate an end of the body.

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10. The apparatus according to claim 9, wherein the guide layer is not attached to the deflection surface.

11. The apparatus according to claim 7, further comprising a cutting tool releasably secured to the body.

12. The apparatus according to claim 11, wherein the cutting tool includes a guide portion, the guide portion contacting the guide layer and being guided longitudinally thereby when the cutting tool is displaced longitudinally relative to the body.

13. The apparatus according to claim 11, wherein the cutting tool is configured to cut through the guide layer when the cutting tool is displaced longitudinally relative to the body.

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